

## Course Plan

<b>Title of course</b>	<b>Molecular Epidemiology in cancer</b>	
<b>Target group</b>	PhD by research students	
<b>Main Objective</b>		
<b>Specific Objectives</b>		
<b>Course description</b>		
<b>Learning outcomes</b>		
<b>Course syllabus</b>	1- Introduction (Contextual framework for molecular epidemiology in cancer)	2hrs
	2- Biomarkers (practical aspects) Biological sample collection	2hrs
	3- processing, storage, and information management	2hrs
	4- Physical, Chemical and Immunologic analytical methods, DNA& Protein (adduct)	2hrs
	5- Assessment of genetic damage in cancers	2hrs
	6- Basic principles and laboratory analysis of genetic variation	2hrs
	7- Bioinformatics	2hrs
	8- Platforms for biomarkers analysis using high-throughput approaches in genomics, transcriptomics, proteomics, metabolomics, and bioinformatics	2hrs
	9- Measurement errors in biomarkers' sources, assessment the impacts on studies	2hrs
	10- Environmental and occupational toxicants <ul style="list-style-type: none"> <li>• Infectious agents</li> <li>• Dietary intakes and nutritional status</li> <li>• Assessment of hormonal milieu</li> <li>• Evaluation of immune responses</li> </ul>	2hrs
	11- Population-based study designs in molecular epidemiology <ul style="list-style-type: none"> <li>• Family-based designs <ul style="list-style-type: none"> <li>○ Linkage study</li> <li>○ Segregation study</li> </ul> </li> <li>• Analysis of epidemiologic studies of genetic effects and gene-environment interactions (Polymorphism, Haplotypes, GWAS, Sample size and consideration)</li> <li>• Biomarkers in clinical medicine</li> <li>• Combining molecular and genetic data from different sources</li> </ul>	6hrs
	12- Combining molecular and genetic data from different sources	2hrs
	13- Biomarkers in cancer prevention	4hrs